

# CALIFORNIA'S HEALTH

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GUY P. JONES  
Editor

## PRESENT STATUS OF RELAPSING FEVER IN CALIFORNIA

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The purpose of this report is two-fold: (1) To review briefly the epidemiology of relapsing fever in California, and (2) to present data on field and laboratory findings in a group of cases which occurred at Pinecrest, Strawberry Lake, Tuolumne County, over the period 1936-1944 inclusive.

### EPIDEMIOLOGY

#### Cases by Years

Relapsing fever has been recognized in California since 1921 but it was not made reportable by the State Board of Health until 1931. Two hundred eighty-three cases have officially been reported through 1944. In Table I are listed the cases by five year periods to 1941 and yearly for 1941, 1942, 1943 and 1944. None of these cases terminated fatally.

Table I

Year	No. of cases
1921-1925	4
1926-1930	7
1931-1935	96
1936-1940	135
1941	16
1942	18
1943	3
1944	4
Total	283

From 1931 to 1936 intensive field and laboratory investigations were in progress, which may account, in part, for added interest in this disease and the reporting of large numbers of cases in the periods 1931-1935

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and 1936-1940. The last two years have been conspicuous for the unusually small number of cases recorded. It is possible that in 1943 the small number of cases may have been due to fewer vacationists in the endemic areas; however, in 1944 the resorts were crowded. More than likely the few cases reported during the two year period was either due to the lack of reporting of the cases on the part of overburdened physicians, or they did not come to the attention of a physician due to the current physician shortage. It is also possible that other epidemiological factors such as changes in the relative abundance of ticks or their hosts may have played some unknown part.

#### Cases by Date of Onset

Relapsing fever has a somewhat limited seasonal distribution and follows rather closely the appearance of rodents from hibernation, the opening of summer cabins and the influx of vacationists. However, "out of season" cases do occur in residents of these endemic foci, and a disease spoken of as "squirrel fever" may possibly be relapsing fever.

Table II is a tabulation of the 283 cases by months and years. June, July, August and September are the peak months accounting for 87.9 per cent of the cases. However, four cases occurred in February, two in April, and two each in November and December. The explanation for some of these cases may be the use of mountain cabins during the winter months and because of the unusual heating of the cabins the ticks come out of their hiding places and seek blood meals.

Table II  
Cases of Relapsing Fever According to Date of Onset

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1921-1925	-	-	-	-	-	-	-	2	2	-	-	-	4
1926-1930	-	-	-	-	-	2	2	1	1	-	-	-	7*
1931-1935	-	2	-	1	3	15	39	30	4	1	1	-	96
1936-1940	-	2†	-	1	5†	18	58	29	16†	5	-	1	135
1941	-	-	-	-	-	1	6	2	2	4	-	1	16
1942	-	-	-	-	-	4	8	4	1	1	-	-	18
1943	-	-	-	-	2	-	-	-	-	-	1	-	3
1944	-	-	-	-	-	-	-	2	2	-	-	-	4
Total	-	4	-	2	10	40	114	70	28	11	2	2	283*

\* Includes one case (1927) definite date of onset not known.

† Case occurring at lower elevation; ‡, two such cases.

Other cabins are occupied during the entire year, as in the case of the fox farm owner whose onset was in February. However, he did his pelting at this time of year and may have been infected from the fox. Another case occurring in February and two cases in May were at lower altitudes and were probably due to *O. parkeri* transmission. One of the April cases was a laboratory infection. Depending on the climatic conditions, the seasonal distribution may shift slightly by years and cases may appear earlier or later because of warm weather.

#### Cases by Age and Sex

Table III presents the cases according to age and sex. 178 cases were listed for males and 105 for females. No cases were recorded for the 0-1 age group. However, Morrison and Parsons<sup>1</sup> have reported a case in a six day old child, the infection being of possible

intrauterine origin as the mother was also a case. All other age groups are represented and although the years 25-34, 35-44, and 45-54 had the largest number, it is felt that this depended on chances of exposure in the endemic foci rather than on age susceptibility.

#### Cases by Geographical Distribution

Certain factors present in the endemic foci have contributed largely to the peculiar geographical distribution of relapsing fever. As noted in Table IV and again on Map A, the infected areas appear in 22 counties of the State. The endemic foci are mainly along the Sierra-Nevada range at elevations over 5000 feet. Two individuals contracted their infections in 1937 in the Coast Range Mountains but at an altitude of 5300 feet. Six others have been infected at elevations of less than 3000 feet; two of these at 250 feet. This variation in geographical distribution is dependent on the difference in tick vectors at the two geographical levels and presents two epidemiological problems of relapsing fever in California.

The first and main problem is at the highest elevations—5000 feet or over, and is due to *O. hermsi* transmission. The second vector is *O. parkeri* which is found in large numbers at elevations of 250 to 4500 feet. (See Map B). The latter tick is far more abundant than *O. hermsi* and potentially should be the source of more infections; however, to date this has not been borne out epidemiologically.

Table III  
Cases of Relapsing Fever According to Age and Sex

Age	Male	Female	Total
0-1 years	-	-	-
1-4 years	6	4	10
5-9 years	17	8	25
10-14 years	19	20	39
15-19 years	23	10	33
20-24 years	13	6	19
25-34 years	30	12	42
35-44 years	22	23	45
45-54 years	28	13	41
55 and over	10	5	15
Adult	7	4	11
Unknown	2	-	2
Total	178	105	283

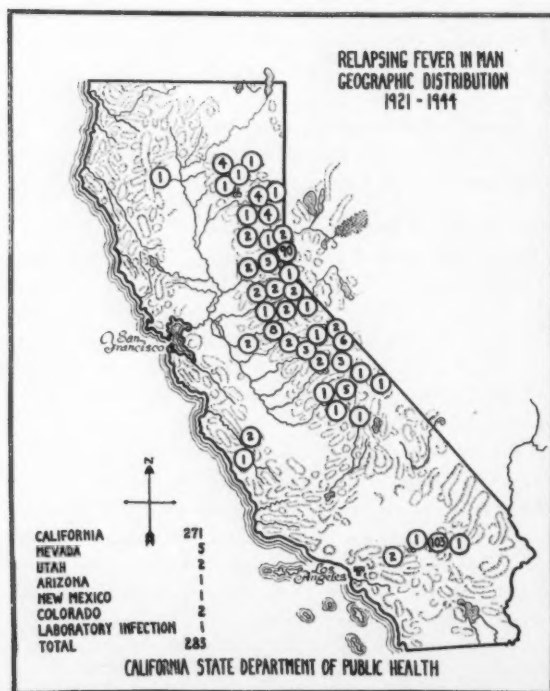


Table IV  
Cases of Relapsing Fever—By Counties and Years

County*	1921- 1925	1926- 1930	1931- 1935	1936- 1940	1941	1942	1943	1944	Total
Alpine	-	-	-	1	-	1	-	-	2
Amadore	-	-	-	1	-	-	-	-	1
Calaveras	-	-	-	1	-	-	-	-	1
El Dorado	-	-	7	25	1	2	-	-	35
Fresno	-	-	1	4	1	-	-	-	6
Inyo	-	-	-	1	-	-	-	-	1
Lassen	-	-	-	5	1	-	-	-	6
Los Angeles	-	-	-	2	-	-	-	-	2
Mariposa	-	-	-	2	-	1	-	-	3
Mono	-	-	3	4	2	5	1	-	15
Monterey	-	-	-	1	-	-	-	-	1
Nevada	2	-	1	2	1	-	-	-	6
Placer	1	3	20	15	1	3	-	2	45
Plumas	-	-	1	5	-	-	-	-	6
San Benito	-	-	-	2	-	-	-	-	2
San Bernardino	-	2	48	33	8	2	-	2	95
Shasta	-	-	-	1	-	-	-	-	1
Sierra	-	-	2	5	-	-	-	-	7
Stanislaus	-	-	-	2	-	-	-	-	2
Trinity	-	-	-	-	-	1	-	-	1
Tulare	-	-	-	1	-	1	-	-	2
Tuolumne	-	-	5	8	-	-	-	-	13
California:									
Calif.-Tahoe†	-	-	2	-	-	-	-	-	2
Nev.-Tahoe Dist.	-	1	2	12	1	-	2	-	18
Nev.-Charleston Flats	-	-	2	-	-	1	-	-	3
Utah	-	1	-	1	-	-	-	-	2
Arizona	-	-	-	1	-	-	-	-	1
New Mexico	-	-	1	-	-	-	-	-	1
Colorado	1	-	-	-	-	1	-	-	2
Laboratory Infection	-	-	1	-	-	-	-	-	1
Total	4	7	96	135	16	18	3	4	283

\* Only those counties reporting cases listed.

† Exact locality undetermined.

Rodent reservoirs; e.g., chipmunks and tamarack squirrels, have been proven by laboratory examination in four locations over 5000 feet in elevation as shown on Map B. These animals serve as sources of infection for at least one tick vector, *O. hermsi*. Animal reservoirs of infection for *O. parkeri* have not been investigated. The habitat of these two transmitting agents varies and may account for the few cases attributed to *O. parkeri*. The latter is found in sandstone caves, rodent borrows and open fields rarely frequented by man. On the other hand, *O. hermsi* is found associated with certain rodents that build their nests in cabins and houses in recreation areas. These dwellings become infected and if the rodent abandons the nest, then the human occupants become the victims of the ticks searching for blood meal. In this way, the ticks are able to survive over long periods of time and even without a blood meal the genus *ornithodoros* may survive from two to five years.<sup>2</sup>

#### Multiple Cases

The incidence of multiple cases in certain summer homes, (Table V) illustrates the development of foci of infection at the higher elevation. In one house, six cases occurred over a period of seven years; and in another, nine people were infected in the course of three



years. Two cases per year were credited to seventeen different summer homes.

Table V

## Multiple Cases Traced to Certain Summer Homes

Number of cabins	Number of cases	Period in years			
		1	2	3	7
17	2	X	--	--	--
1	4	X*	--	--	--
7	2	--	X	--	--
6	3	X	--	--	--
2	3	--	X	--	--
1	4	--	X	--	--
1	5	--	X	--	--
1	6	--	--	--	X
1	9	--	--	X	--

\* 4 Cases in C.C.C. barracks in one year.

## PRESENT INVESTIGATION

## Summary of Cases

Multiple cases in one cottage were again brought to the attention of the State Department of Public Health in the fall of 1944. Two cases of suspected undulant fever were reported in July from Pinecrest, Tuolumne County. An investigation was made and one case

(P.L.) was diagnosed as relapsing fever. The clinical diagnosis was confirmed by animal inoculation. The second case (T.H.) was diagnosed clinically as relapsing fever and recovered after five attacks. The laboratory examination was negative since the blood was collected twelve days after the last relapse.

As soon as the positive diagnosis of relapsing fever had been established, the owner of the cottage began to reconstruct the incidence of illnesses among the guests and renters over a period of years. Records regarding the cottage had been extremely well kept and were made available for our use. Data were obtained on 12 cases from 1936 to 1944, and the information summarized in Table VI. The diagnosis in eleven of these patients was on the basis of clinical and epidemiological findings. As noted in the table, each of the twelve patients occupied the cottage for a period of from one week to a month prior to onset. In cases 2 and 3 the information is meager as the owner did not have the renters' names and further checking could not be done.

Table VI

## Cases of Probable Relapsing Fever—Cottage "P," Pinecrest

Case	Age	Sex	Date of onset	No. of attacks	Laboratory tests	Epidemiology
1. E. McC.	50	M.	July, 1936	Unknown	None	Rented Cottage "P" July 1 to 31, 1936.
2. Mother	A.	F.	1937	Unknown	None	Rented Cottage "P" July 1 to Aug. 1, 1937. Reported cases as "tick fever" and supposed to have found ticks.
3. Daughter	A.	F.	1937	Unknown	None	
4. A. P.	23	F.	July 29, 1938	1	None	At Cottage "P" July 15-29, 1938. Diagnosis: sunstroke. Slept upstairs.
5. A. P.	57	M.	Aug. 14, 1938	5	None	At Cottage "P" July 15-29, 1938. Diagnosis: undulant fever. Slept upstairs in cottage.
Cottage not opened during 1939.						
6. Mrs. C. D. S.	55	F.	June 4, 1940	6-7	Neg.	At Cottage "P" May 21-28, 1940. Diagnosis malaria. Recurrent attack Aug., 1940, following trip to Tahoe. Slept upstairs in cottage.
7. E. A.	52	F.	June, 1940	2	Neg.	At Cottage "P" June 19-27, 1940. Diagnosis pyelitis. Temperature 104°. Slept upstairs in cottage.
8. Mrs. A. P.	57	F.	Aug. 15, 1940	4	None	At Cottage "P" Apr. 18, May 21-28, June 19-27, July 31-Aug. 3. Diagnosis "flu." Slept in upstairs room.
9. Mr. P.	A.	M.	Aug., 1940	?	?	At Cottage "P" Aug. 11-31, 1940. Was taken to Stockton Sanitarium because of illness.
Cottage not opened during 1941.						
10. Mrs. A. P.	58	F.	Sept. 6, 1942	1	None	At Cottage "P" Aug. 15-29, 1942. 2d attack. Diagnosis: "flu." Slept upstairs at cottage.
Cottage not opened during 1943.						
11. T. H.	9	M.	July 4, 1944	5	Neg. Blood taken 12 days after last attack and oxalated.	At Cottage "P" June 18 to July 4, 1944. Diagnosis: undulant fever. Slept upstairs at cottage.
12. P.L.	6	M.	July 20, 1944	4	Pos. by animal inoculation 8-11-44 for T. recurrentis	At Cottage "P" June 18 to July 20, 1944. This child slept downstairs until June 30 when he was moved to upstairs room. Diagnosis: undulant fever.



### Field Survey

Following the occurrence of eleven clinical cases and one laboratory proved case of relapsing fever in a single cottage over a period of nine years, a field survey was made at Cottage "P" with interesting results.

### The Cottage

Cottage "P" was built in 1923 on the rocky bank of Strawberry Lake at an elevation of 5600 feet. It is a frame, single walled building constructed on a large log. There is a main living room the width of the building with an attic bedroom reached by steps from the outside. The ceiling of the bedroom slopes at a sharp angle to within 14-18 inches of the floor. At the back of the house are attached three small rooms; e.g., kitchen, shower and dressing room. A wide veranda extends around the cabin on three sides and is used as a sleeping porch.

The two sections of the cottage have separate roofs. The front part extends over the back rooms for six or eight inches leaving an open space the full length of the building with the inside wall the baseboard of the upstairs bedroom. There were openings at either end of this runway which had been gnawed out by chipmunks and woodrats.

A thorough search was made of the building to determine the presence of rodents' nests and ticks. Ticks had been observed, according to the owner, on the outside wall just below the roof of the dressing room. The entire dressing room had been lined with tongue and groove boards to make it rodent proof as bedding, et cetera, was stored there during the winter. A space of six inches existing between the ceiling of the dressing room and the roof. To add to the warmth, building paper had been laid over the old roof and a second layer of shakes nailed on. A large chipmunk's nest was located in the above mentioned space. In the nesting material live ticks with recent blood meals were found. These were identified by Professor W. B. Herms, University of California, as *O. hermsi*, the transmitting agent of relapsing fever at the 5000 feet elevation.

Table VI reveals that eight of the twelve cases for which data were available slept in the attic bedroom. The possibility exists that rodents traveling along the runway may have had ticks on them which dropped off and these ticks crawled through the cracks of the single walled partition into the bedroom, or that the ticks may have migrated from the nest into the room. No history was obtained from the occupants of this room of having seen ticks or having been bitten by them. However, that is not unusual as the majority of patients in the California series fail to give a history of having been bitten.

### Rodent Survey

Rodents were observed around the old stumps and rocks near the cottage and also on the roof of the building. According to the owner, a dog had been kept on the property from 1923 to 1931 and she felt that the dog had been responsible for keeping the rodents away. All the cabin owners in the neighborhood, however, fed the rodents and in fact, encouraged them to come to their cabins.

In 1935 a chipmunk was brought from Lake Tahoe as a pet to the Cottage "P." Lake Tahoe is one of the most important endemic foci in the State and this animal may have been responsible for introducing the infection into this particular cabin but not to the Strawberry Lake area, as cases of relapsing fever had been reported in 1933 and 1934. Apparently, some time is required to establish a permanent focus of infection within a building since no illnesses were reported from this cottage from 1923 to 1936. The cottage was not opened in 1939, 1941 and 1943, and may have assisted in building up the rodent and tick populations.

The survey was conducted with the assistance of the Rodent Control Crew. A total of 50 animals were collected in, on or within close proximity of the cottage. Table VII is a resume of the animals examined with the results following mouse inoculation. These rodents were either trapped or shot. They were immediately frozen with CO<sub>2</sub> and brought to the laboratory for examination. Usually two to five days elapsed before inoculation when the animals were thawed and autopsied. They were observed particularly for enlargement of liver and spleen. Blood clots from the heart and spleen material were pooled, ground up and inoculated intraperitoneally into white mice. The mice were bled from the tail for 15 days beginning on the third day after inoculation. Two pools of chipmunks representing three animals in each pool were found positive for *T. recurrentis*. The incubation time in the mice was six days for each pool. Four of the six chipmunks found positive showed enlarged spleens at autopsy.

The present investigation emphasizes the epidemiological pattern of relapsing fever at the higher elevations and by the fulfillment of the following criteria completes the evidence necessary to establish Cottage "P" at Pinecrest as a focus of infection for this disease.

- (1) Location of rustic type mountain cottage at an elevation of 5600 feet.
- (2) Discovery of *O. hermsi*, the vector for relapsing fever at elevations over 5000 feet, associated with a rodent's nest within the building.
- (3) Demonstration of the causative agent, *T. recurrentis*, in chipmunks, a proven reservoir of infection at 5000 feet, collected close to and on the cabin.

- (4) Incidence of 12 cases over a period of nine years; 11 diagnosed in retrospect on the basis of clinical and epidemiological findings, and one on laboratory examination. None of these cases has been included in the official reports, as yet.

Table VII

## Number and Kind of Animals Examined with Results

Kind of Animal	No.	Positive*	Negative*
Peromyscus maniculatus	19	0	19
Wood Rat (Neotoma)	7	0	7
Chipmunk (Eutamias)	13	2 pools (6)	7
Tamarack	5	0	5
Ground Squirrel—C. beecheyi	6	0	6
Total	50	2 pools (6)	44

\* Animal inoculation.

## Discussion

The recent experience as described above, would seem to indicate that cases of relapsing fever may occur which are not recognized or are misdiagnosed. A study of Table VI illustrates this point and includes such diagnoses as undulant fever, malaria, pyelitis, influenza and sun-stroke. The possibility of undiagnosed cases was previously discussed with reference to Table I. Therefore, it seems pertinent at this time to review briefly the clinical features of relapsing fever.

This disease is characterized by a sudden onset with fever, frontal headache, and pains in back, limbs and joints. Nausea and vomiting may occur and prostration is marked. In a few instances in the California series, a rash has been noted. The attack usually lasts two to four days and the symptoms repeat themselves within three to twelve days. During the afebrile period, the individual is entirely well. If no treatment is given, there may be as many as 12 relapses; however, the majority of cases in the California series have two to four attacks; occasionally as many as eight, each of decreasing severity. A single "adequate" dose of neosarsphenamine is considered sufficient to effect a complete cure.

In California, a differential diagnosis should be made between relapsing fever, influenza, undulant fever, malaria, typhoid and typhus fever, especially in patients who have been in mountain resort areas. This is accomplished with certainty by laboratory examination.

Of the 283 cases reported to the State Department of Public Health, 225 or 79 per cent were positive by laboratory test.

The laboratory diagnosis of relapsing fever is by either of two methods: (1) Blood smear or (2) animal inoculation. Blood smears should be prepared as thick or thin films and obtained at the peak of the attack before treatment is given. Wet preparations may be examined under the dark field if equipment is available.

The smear method is of little value during remissions and at other times during the course of the disease when the spirochetes are few in number. Therefore, the method of animal inoculation is recommended, bearing in mind that for the best results the specimen of blood should be collected during the height of the attack. However, blood for animal inoculation may be collected when the temperature is on the downward trend or between relapses if treatment has not been administered.

## Summary

- (1) Relapsing fever was first recognized in California in 1921. 283 cases have been reported to the State Department of Public Health from 1921 to 1944 inclusive.
- (2) The disease has a peculiar seasonal distribution, the peak months being June, July, August and September.
- (3) The geographical distribution is limited to a certain extent—22 counties of the State are included. Most of these are along the Sierra-Nevada Range at 5000 feet or over in elevation.
- (4) The epidemiology of relapsing fever is divided into two problems and is dependent on the transmitting agents at different geographical levels. The first and main problem is at 5000 feet and is dependent on *O. hermsi* as the tick vector. The second is at 250 feet to 4500 feet and is dependent on *O. parkeri* as the tick vector. Few cases have been traced to the second vector.
- (5) Rodent reservoirs; e.g., chipmunks and tamarack squirrels have been proven in four areas, all over 5000 feet in elevation.
- (6) Details are given of a recent epidemiological investigation involving 12 cases from a single cottage at Strawberry Lake over a period of nine years.
- (7) Emphasis is placed on the differential diagnosis of this disease and the value of laboratory examination especially in patients who have been in the mountain resort areas.

## References

- (1) Morrison, S. K. and Parsons L.—Relapsing Fever: Report of three cases; one in a six day old infant. *J. A. M. A.* 116—p. 220, 1941.
- (2) Monograph Number 18—Relapsing Fever in the Americas, Frances, Edward—The Longevity of fasting and non-fasting *O. turicata* and the survival of *S. obermieri* within them—p. 85. (American Association for the Advancement of Science, 1942)

For the laboratory diagnosis of relapsing fever by animal inoculation, blood may be sent by regular mail to:

STATE DIVISION OF LABORATORIES  
3003 Life Science Building  
University of California Campus  
Berkeley, 4, California

The specimen should be 10 c.c. whole blood collected aseptically, and allowed to clot. No chemical agent should be added to the blood.

# EARLY PUBLIC HEALTH IN CALIFORNIA

(CONTINUED FROM OUR LAST ISSUE)

By GUY P. JONES

## CHOLERA PROMPTED PUBLIC HEALTH

It is apparent that Asiatic cholera, particularly the intensive outbreak of this disease that occurred in Sacramento in 1850, constitutes the primary factor that led to the organization of medical forces to combat epidemic diseases and to the later organization of the Sacramento City Board of Health and the California State Board of Health. The public attitude toward cholera in the midst of the Gold Rush is interesting, for the brand of psychology displayed is no different from that which is displayed today toward infantile paralysis and other extremely disastrous diseases, concerning the cause of which little or no information is available.

As early as May of 1850, the newspapers reflected an undercurrent of fear lest Asiatic cholera come into California. The *Daily Alta California*, published in San Francisco, in its edition of September 27, 1850, published an editorial entitled "Sanitary," in which considerable apprehension relative to the possibility that cholera might invade California was expressed.

As early as May, 1850, the newspapers had published considerable material relative to the hardships suffered by immigrants in their long overland journeys to the Golden West, but in September, before cholera actually made its appearance in the State, the *Daily Alta California* stated: "The recent afflictive news from the plains where, in addition to all other horrors, Indian warfare and terrible famine, cholera is also doing its dreadful work, still marching on in its westward progress, as well as the melancholy reports of death by cholera on the Isthmus of persons recently from this place, together with the knowledge that that dreadful disease is in existence in some of the Mexican ports between Panama and this city, makes it imperative upon the authorities and citizens of this place to take care that no local cause be left here as an excuse for its appearance." The editor even stated in graphic terms that "The name and character of cholera first made blank and pale the cheeks of those who saw or read of its ravages. Moving on in mystery and terror, striking to right and left, yet all the time progressing, never stopping, never tarrying, on and still on. Mountains, although they raise their bold heads and snowy crown to the heavens can not fence it back. Up and over them it moves at the same rate, down their western slopes it passes, and the plaints of the village echo back the city's wail telling of the destroyer's presence. No ocean so deep or broad that it can not pass, no river so swift that it finds not a bridge across the whirling tide. For eli-

mate it cares nothing. It is the great leveler, annihilating all respect to classes and to professions. The pampered effeminate and the hardy warrior, the prince and the plowman fall alike before it. Onward still it marches, 30 miles a day, never varying, never lagging, never satiated. The grave may be glutted, the cholera is never satisfied."

The editor continues, "We wish to warn the people of San Francisco and of California that, though out of the Union, perhaps you are not out of the range of the destroyer's path." Although this editorial appeared in the edition of September 27th and California had been admitted to the Union 18 days before on September 9, 1850, word of the admission did not reach California until October 20th. He urged that the people improve their living conditions, asking that the authorities and citizens, too, remove the great amount of filth on the city streets. He concluded with the prophetic words, "The cholera is approaching us on both sides. It is already at the foot of the Sierra Nevada. It is coming up the coast of Sinaloa. When it will come or whether, we can not say, but this we do say to all: PREPARE."

## NEWSPAPERS REFLECTED APPREHENSION

On October 10, 1850, the *Daily Alta California* said, "There has been some little apprehension excited for a few days past, from the fact that steamers having arrived which had had cases of cholera on board and come from regions where the disease was known to have prevailed. We consider these apprehensions utterly groundless, however, although we should be the last to endeavor to lull the public into a false security, if danger of an epidemic disorder absolutely threatened. But we can see no pretext for indulging in such an expectation. That cholera can exist here we have not the slightest doubt; but that it can be brought here by ships, we do doubt, for we are and always have been noncontagionists, and have always opposed the oppressive quarantine laws. The fact that there has been a good deal of dysentery and diarrhea prevalent within the last few weeks, has been calculated to alarm people; but when it is well known that this fall there has been great quantities of fruit brought in to the market, mostly but partially ripe, we do not consider this fact at all surprising or alarming. We have heard that there have been one or two cases very closely resembling cholera in the city, but the symptoms were similar to those exhibited in other diseases; and we do not believe there has been a single case which has come under the knowledge of any respectable physician here, unless it



might have been some passenger who was sick on board the 'Carolina,' which could be positively pronounced Asiatic cholera. Still it is a subtle foe, and one to be guarded against, and it behooves people, while it is hovering over the continent with its poisonous, deadly breath, to be careful of their diet, and abstemious in their habits generally where it may appear, or when."

#### HALF OF THE POPULATION FLED

After the dread disease had finally appeared in Sacramento, pandemonium prevailed. Half of the population, which was about 7,000, fled the city immediately and those who remained, of necessity, were panic-stricken. There had been considerable discussion relative to the death of Dr. Noble, so much, in fact, that his attending physician, Dr. John F. Morse, found it necessary to write a long letter to the *Sacramento Transcript*, published October 30, 1850, which was given the caption, "Cholera: The Effects of Fright." In this letter Dr. Morse described the symptoms of his patient with minute detail. He stated, however, that he believed most cases of the disease originated in the excessive anxiety and depressing fear which prevailed in the community. He said, "I have seen men who probably have not drunk a glass of brandy and water for years, who are now swallowing it with a voracity that almost staggers an old toper. Others are carrying about them constantly the various specifics which are, I believe, doing more to spread the disorder than the vilest malaria that ever committed aggressions upon the animal economy. Other men are going about the city with huge pieces of camphor in their pockets, a crumb of which is taken whenever a diseased fancy suggests the propriety. All my intercourse with the physicians of this city assures me that I am speaking the truth. Where people throw themselves into the hands of their physician (and here let me remark that in no place are there better physicians than in Sacramento) and are satisfied to be guided by their advice, there is little fear of cholera. From physicians, I can not gather any information of the severe prevalence of this disease and their general opinion is, I believe, that a great proportion of the cases are entirely due to the influences I have enumerated. With a hope that individuals will become more rational in contemplating this malady, especially where they have seen the sad illustration alluded to in this communication to guide and convince them, I will close my paper, which is already too long."

(To be continued in next, and succeeding issues)

### INDUSTRIAL MEDICINE AND NURSING SERIES OF LECTURES AT THE PORT DISPENSARY FORT MASON, CALIF., UNDER THE U. S. ARMY INDUSTRIAL MEDICAL PROGRAM, SAN FRANCISCO PORT OF EMBARKATION

No.	Subject	Speaker	Date
1.	History of Industrial Nursing and its Future	Mrs. E. M. Watson, Industrial Nursing Consultant, Calif. State Health Service	Nov. 29
2.	Functions of Nurses at a Port of Embarkation	Lt. Col. Jean Felton, Industrial Medical Officer, S. F. Port of Embarkation	Dec. 6
3.	Industrial Diseases, Medical Aspects of	Dr. Harold Kastberg, Chief, Bureau of Industrial Health, Berkeley, Calif. (State Health Service)	Dec. 13
4.	Industrial Diseases, Engineering Aspects of	Mr. Frank Stead, Chief Industrial Hygiene Engineer, Bureau of Industrial Health	Dec. 20
5.	Health Education	Dr. Wm. P. Shepard, 3rd Vice Pres., Metropolitan Life Insurance Co.	Dec. 27
6.	Health Education	Mr. Arthur C. Painter, Health Educator, Venereal Disease Section, S. F. City Health Dept.	Jan. 3
7.	Legislation, Federal, State, etc.	Mr. Warren Hanna, Att'y formerly with the Calif. Industrial Accident Commission	Jan. 10
8.	Legislation, Labor Laws, etc.	Mr. Dixon, Rep. of U. S. Employees' Compensation Commission	Jan. 17
9.	Non-occupational Diseases	Dr. Rodney Beard, Pan-American Airways	Jan. 24
10.	Women in Industry	Dr. A. C. Dick, Consolidated Aircraft Corporation	Jan. 31
11.	Mental Hygiene	Major L. Lipschutz, Chief, Neuropsychiatric Section, Station Hospital, Camp Stoneman, Pittsburg, Calif.	Feb. 7
12.	Accident Prevention	Mr. John Moke, Accident Prevention Branch, S. F. Port of Embarkation (Fort Mason)	Feb. 14
13.	Medical and Nursing Techniques (Workshop)	Miss Charlotte Ferry, P.H.N. Industrial Nursing Consultant, Calif. State Health Service (Los Angeles)	Feb. 21
14.	Medical and Nursing Techniques (Workshop)	Mrs. Erma Thorson, Chief Nurse, Industrial Medical Program, S. F. Port of Embarkation and Lt. Adelaide Brady, Chief Physiotherapist, S.F.P.E.	Feb. 28
15.	Industrial Medicine in Action	Dr. Clifford Kuh, Permanente Foundation Hospital, Oakland, Calif.	Mar. 7

These lectures are open to all interested in industrial medicine and nursing. Each session will be of one and a half hours' duration, from 7.30 to 9 p.m., each Wednesday evening. No tuition will be charged. Lt. Col. Jean Felton, Industrial Medical Officer for the San Francisco Port of Embarkation, will preside.

Location Bldg. 240, Port Dispensary, S.F.P.E., Fort Mason, Bay Street at Van Ness Avenue.

#### CRIPPLED CHILDREN

The staff of the Crippled Children's Bureau recently made an investigation of cases pending and found that there are 623 crippled children who are now awaiting care. Every effort is being made to place these children under medical care at the earliest possible time since it is well-known that in most crippling conditions the earliest possible treatment will get the best results, and secondly the cost of early care is less in the majority of cases than is the cost of late care.

Clinics for diagnosis were held at Marysville, Chico, Santa Ana, and Woodland during the month of November.

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